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PEB 371

Memorandum to File

14 November 1955

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Conference on Prefabricated Buildings

PURPOSE OF TRIP

On the 11th of October 1955 [redacted] Office of Communications and [redacted] of the Office of Logistics drove to the Marine Base at Quantico Virginia for the purpose of participating in a conference devoted to research and development work in the field of prefabricating buildings. The Office of Communications interest in this program is based upon an information requirement for structures to house the "Stockpile" stations, and, as information to be used to meet any future needs to house installation of communications facilities. This conference was arranged by the Research and Development Division of the Office of the Secretary of Defense. Liaison work was done by [redacted] Office of Communications and Mr. G. B. Wareham of the Office of the Secretary of Defense (Code 131 Extension 55531).

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GENERAL PROGRAM

The conference was divided into two parts, a morning program from 1000 to 1130 and an afternoon program from 1300 to 1530.

The morning program was conducted on a portion of the Marine Corp Air Base and consisted of (a) a series of lectures on the development of the geodesic shelter and other related prefabricated structures used by the Marine Corp., and (b) a demonstration of the erection, outfitting, and aerial transporting of the geodesic dome shelter.

At the conclusion of the lecture and demonstration period, the group was allowed to inspect a number of Marine Corps developed prefabricated structures and to ask any questions relative to these structures from officers working on these projects.

The Afternoon program was conducted at the Marine Base auditorium and consisted of a series of lectures and discussion periods given by participating Government groups.

The first lecture was given by Col. Lewis from the Corps of Engineers who discussed the Corps program. This was followed by a detailed lecture by Mr. Bartelmes on some of their "Systems of Buildings" design work.

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Next a lecture was given by a man from the Bureau of Yards and Docks, Department of Navy, relative to their development in the field of structures using rigid frame and sheet metal construction.

The third lecture was given by the Air Force, with overall programing being presented by Col. Bagby. Detail lectures were given by two of their Engineers, Lt. Reemes, from the Wright-Patterson Development Field and Mr. Burke from the Rome Air Development Center. They discussed units developed for Tactical Air Command, a unit similar to the Army T-5 structure, and a modular shelter development for communication and radar equipment. Also mentioned their mobile designs which included Project Wagonwheel and various truck mounted and air craft service shelters.

Development of portable field shelters and tents was next discussed by Dr. Kennedy from the Quartermaster Corp.

The program was concluded by Col. Woodward, who gave a resume of the development of the Marine Corp Shelters.

ITEMS OF INTEREST TO THE AGENCY

1. Marine Corps

The prefabricated structure which seems most adaptable to Agency communications requirements is the type TSQ shelters which was designed by the Marine Corp specifically for electronic equipment housing. This shelter is available in two geometric configurations. The first configuration is a 1/3 sphere having a 12 foot center height and a 20 foot diameter at the ground. The Second configuration is made by dividing the 1/3 sphere into 2 parts and inserting a cylindrical section between the spherical ends. The resulting structure resumbles the well known Quonset hut and is 20 ft wide, 40 feet in length and has a center ceiling height of 20 feet. This building can be expanded in length in increments of 10 feet to a maximum of 60 feet. The designation for the first configuration (1/3 sphere) is the AN/GSQ-5 and for the second configuration (Quonset hut type) is the AN/GSQ-6.

These shelters are made in panels approximately 3 feet square, of formed fiber glass material reinforced with balsa wood ribs. The panels are completely interchangeable and are fastened together with a pin type connection similar to the camlock fastener. Assembly of the shelter is made using a small hand wrench and a 10 foot aluminum tube erection pole. A crew of six (6) men can completely assemble this shelter in 45 minutes.

Joints between the panels having replaceable rubber gaskets to seal cracks and keep all joints light and weather tight. The rubber gaskets in appearance look like the extruded rubber door seals used in automobiles.

This shelter is also equipped with a duct system for exterior connections to either, (a) an eight ton air conditioner or (b) an aircraft pre-heating unit. These structures were designed to withstand air

velocities up to 150 miles per hour if properly secured. The shelter can be transported using a CH35 or CH25 helicopter. The initial pilot model of this development cost $8500.00. On a production run of approximately 30 units the costs of each shelter was $5500.00 and it was anticipated that on a larger quantity of production the cost might drop to $3500. At present, the main disadvantage in this shelter is the fact that a suitable floor system to hold heavy electronic equipment is not available. Marine Corps Engineers are currently developing a suitable type floor system to support heavy loads but at the time of the conference, the completion date of this design was unknown. The pilot models of this shelter were fastened to airport taxi strips and the heavy equipment placed in the interior directly on the strip areas for support.

2. Corps of Engineers

The Corps of Engineering have under development a "System of Buildings" which have steel frames and utilize a bolted joint, "bedstead" erection type device. This structure size is 20' x 48' and in plan has vertical walls, and is available in four phases of completion.

The first phase consists of the steel frame work and a complete roof only. This could be used for tropical type storage facilities and similar uses.

The second phase consists of the same steel frame work with a complete roof and floor system.

The third phase consists of phase 2 plus completed walls, windows, and door units but with no interior finishes on the wall and no insulation. This could be used for barracks in temporate zones, warehouses and similar uses.

The fourth phase consists of phase 3 with completed wall, ceiling, and floor insulation.

For Army aviation uses, the Corp is developing a rigid frame steel building with a 30 foot wall height. It is used for servicing helicopters and light liaison aircraft.

3. Navy Yards and Docks

The Navy Yards and Docks development consists primary of a 20' x 48' rigid frame sheet metal building similar to the Quonset hut but with straight side walls rather than the curved type. They are also developing in conjunction with the Butler Manufacturing Company a 40 x 100 rigid frame type building principally for warehouse use. These buildings at present hold only an academic interest to the Agency.

4. Air Force

The Air Force have currently under development a prefabricated structure they call a "Wonder Building". They are consulting with a private firm

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called [redacted] for this development. On this type of construction, the building is made up of deformed sheets of metal, either aluminum or steel, having nut and bolt fastenings. The sheets are deformed so that they are approximately 18" deep and 24" wide, and, when bolted together form a structure appearing very much like an oversize corrigated drainpipe. Nothing further was mentioned relative tot this development but it appears to have enough merit to warrant further study.

The Air Force is also developing a prefabricated shelter known as the "Modular Shelter" and is designed around a nodule which is a cube 8 foot by 8 foot by 8 foot. They are proposing to fabricate buildings up to a maximum width of 32 feet and a maximum length of 96 feet available with either 8 or 12 foot height. These units are being developed primarily for the use of radio and communications equipment and the Air Force indicated that the 8 foot cubic module was dictated by the size of equipment. 25X1A

They are also working on several other projects, namely "Wagonwheel", and a number of tractor and truck equipments designed for them [redacted]

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5. Quartermaster Corps

Of possible interest to the Agency also was the development by the Quartermaster Corps of a disposable shelter made of paper, cardboard and related plastic materials. These shelters are designed primarily for field use and will be abandoned in the field rather then repacking and reusing. Since nothing other then mentioned of the development work was brought out by Mr. Kennedy, it might be well to persue this development further for a possible agent and/or field communications use on a limitedd basis.

CONCLUSIONS

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It is recommended that further work be undertaken by OC-Engineering on (1) current floor systems development for the type TSQ shelters, (2) that [redacted] development in the field of mobile communications units, (3) the Corps of Engineers, "System of buildings" and (4) the Air Force "modular cube shelter".

The conference was a valuable one from two points of view, First, it enabled Agency people to obtain current consolidated information on prefabricated structure development and planning. Second, it enabled us to meet and to know people in other Government components doing prefab shelter work and established contacts that may be considerable future value if the Agency has requirements for communications shelter facilities.

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Attachment:
3 Sheets - General information on the geodesic shelter